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ABSTRACT

The unit box concept is an inquiry-oriented unit of instruction which helps preservice students develop teachable science units based on commercially available teaching guides. The unit box (which utilizes appropriate concrete materials to encourage hands-on learning for elementary students) contains everything needed to teach a specific unit, including the hardware, supportive software, media, and manipulative materials. There are 16 components of a unit box. They include: one or more manipulative-oriented teaching guide(s); manipulative materials; behavioral objectives; letter to parent(s)/guardian(s) to introduce the unit; set(s) of record sheets used during the unit; optional commercial audiovisual aids and related materials; optional overhead transparencies; trade books at the appropriate level; background information for the teacher; sources of potential human and/or material resources; optional vocabulary cards/games; evaluation procedures; bulletin board plans; task cards for poor readers; instructional materials; and a large sturdy box to contain the previous items. Information on each of the unit box components and on the preparation of the boxes by preservice elementary teachers is provided. (JN)

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UNIT BOX - - AN UP DATE APPROACH FOR THE 1980'S

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by

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The unit box concept, introduced by Batoff (1974A, 1974B, 1975), is an inquiry oriented unit of instruction which uses resources teachers have (i.e. textbooks) as a guide. The unit box contains everything needed to teach a specific unit of instruction, such as the hardward, supportive software, media, etc. The unit box, which utilizes appropriate concrete manipulate materials, encourages hand-on learning for elementary students.

Unit boxes, designed by preservice teachers, provide actual experiences of preparing a unit of instruction for teaching. In the elementary science methods course (Ed M116--Teaching Science in the Elementary School), preservice students are required to assemble a unit box of their own choice. Each unit box is to contain material needed for a minimum of ten daily lessons. The preservice student's assignment incorporates nine of Batoff's original unit box components and seven additional components assigned by the author. (1)

These sixteen components are:

*1. One or more manipulative-oriented Teachers Guide(s). These guides are used as a starting point for their unit. Prior to starting the unit box, the students have examined in detail the Elementary Science Study, Science Curriculum Improvement Study, Science--A Process Approach, and commercial textbooks.

*2. Manipulative materials. There needs to be sufficient quantities of concrete objects for each child. Expensive and/or unusual items are encouraged to be utilized in learning centers. Since the majority of elementary students the preservice students will

1. Batoff's original components are labeled with a *. Also, Batoff had an additional component, a construction project which was to enrich the unit box.

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be teaching will be either preoperational and/or concrete operational according to Piaget (Ginsberg and Opper, 1969), the manipulative orientation to learning is of paramount importance. Common manipulatives found in unit boxes have included measurement materials, shells, plant specimens, artifacts, etc. Perishable material, i.e. live organisms, food, etc. are not required to be included in the unit box but are to be listed by the preservice student. The unit box assignment necessitates that the preservice students procure, fabricate and/or improvise the appropriate concrete manipulative materials that facilitates learning by elementary students.

A classroom unit box needs list, posted in the Ed Mlio classroom, allows the preservice student to list the material they are having difficulty locating. Other preservice students are encouraged to share materials they have found. The sharing of materials encourages the sharing of ideas that promotes public education expertise.

3. Behavioral objectives. Each preservice student is to include objectives for cognitive, affective, and psychomotor domains. This component allows the preservice students to practice skills from previous education courses.

4. Letter to parent(s)/guardian(s) to introduce the unit. One of the problems in education is the lack of communication between home and school. The use of an introductory letter allows for learning to be extended beyond the classroom. Beisenberg (1980) is recommended as a reference for developing this letter.

*5. Set(s) of record sheets that would be used in teaching the unit. Preservice students will submit prepared masters for all worksheets.

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*6. Commercial audio visual material with worksheets and manipulative materials are optional.

*7. Set(s) of overhead transparencies made by preservice student are optional.

*8. Trade books at appropriate level. Each preservice student is to locate three or more trade books at the appropriate grade level for their unit box. The trade books can either be fiction or non-fiction and are to supplement their unit. This component allows the preservice students to incorporate story time into their science units.

Several sources of trade book reviews are recommended to the preservice student to help them in locating trade books for their unit box. The March issue of Science and Children (National Science Teachers Association, 1742 Connecticut Avenue, N.W., Washington, D.C. 20009) each year contains an annotated bibliography of the outstanding children's science trade books for grades K-8 that were published during the previous year. These books are usually non-fiction and grade levels are recommended. Appraisal (Diane Holzheimer, Editor, 35 Cummington Street, Boston, Massachusetts 02215) another source for trade books is published three times a year by the Children's Science Book Review Committee, a non-profit organization sponsored by the Department of Science and Mathematics Education of Boston University School of Education and the New England Roundtable of Children's Librarians and Science Specialists. This source lists recommended ages and ratings by the the librarian and science specialist for each trade book which are

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usually non-fiction. Appraisal includes reviews by librarians and science specialists about the content and style for each trade book. Each issue of the Horn Book (Horn Book Incorporated, Park Square Building, 31 St. James Avenue, Boston, Massachusetts 02116) contains a column "Views on Science Books." These reviews are organized by science disciplines with recommendations as to what age the the trade book should be used. These bimonthly reviews are usually of non-fiction trade books. Students also have utilized relevant children's magazines such as Ranger Rick, National Geographic World, etc.

These trade books are used by the preservice teacher in designing literature units (Huck, 1979; and Barrow and Salesi, 1982). It is important that the trade books are at the elementary student's reading level. To determine the appropriate readability level, the preservice students can utilize Fry's Readibility Scale (1977). If the unit box is for very young children, preservice students are asked to select trade books to read to the children.

9. Background information for the teacher. This section includes concepts stressed in the unit box, which is usually included in the teachers guide (#1 above).
10. Potential source of field trip(s), resource speaker(s), and/or audio visual source(s) are optional. If a field trip plan is included in the unit, a parental permission slip form must be included for future usage. This component must compliment the total unit rather than be used in isolation.

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11. A set of vocabulary cards and a vocabulary game are optional. Common components that preservice students have incorporated are crossword puzzles and "find the hidden word." This component allows the preservice students to utilize skills for teaching reading in the content area of science.

*12. Evaluation procedure. Each preservice student is to consider evaluation procedures that will provide them with information about the child. The evaluation will include both formative and summative evaluation, if appropriate. The evaluation component will be based upon the objectives for the unit, and there will be at least one evaluation procedure for each objective. Both informal and formal evaluation procedures can be utilized.

13. Bulletin board plans. Each unit box will contain a drawing of the bulletin board which will be displayed when the unit is taught. The drawing is used instead of the actual material for the bulletin board because of the variability in the size of bulletin boards.

14. Task cards for poor readers. Since every class today has several students that are reading below grade level, task cards for poor readers are to be included in the unit boxes. The Rebus technique as described by Barrow and Nair (1979), is to be used in designing the task cards. The Rebus technique uses pictures of things which are substituted for word(s), action(s) and/or meaning(s) (Aukerman, 1971). Examples of universally known rebus symbols presently in use are men and women's restrooms, telephone, railroad crossing, highway and airport, etc. For poor readers, a Rebus technique is

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drawing a picture of a pair of scissors instead of using the word "scissors." (Figures 1-4 show examples of task cards for poor readers.)

Insert Figures 1 and 2 about here

Rebus task cards can be used at any grade level. It is important that the task cards do not have too much writing on each card. The task cards could be arranged in a series like that shown in Figure 1. Classroom management procedures may be incorporated into task cards as shown at the bottom of Figure 3. The printed word below the drawn symbol (Figure 4) may be included for use with upper elementary students. This helps the upper elementary child recognize the printed word. The logical starting point for constructing rebus task cards is to start by using existing task cards. Some rebus task cards have been generated by asking poor readers what could be substituted for the printed material. After field testing the rebus task cards, adapt the rebus task cards utilizing suggestions from the students.

15. Variety of instructional materials. A variety of instructional materials such as large pictures, charts, science learning games, task cards, etc., should be included in the unit boxes. This component encourages the preservice student to utilize learning centers. The center approach allows for individualization.

*16. A large sturdy box, smaller containers and a file, all labeled and organized for containing all of the above items, are to be included in the unit boxes. Numerous preservice students have utilized their entire unit box container as the background for

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their learning center. An attractive attention getting object such as a lobster trap encourages the students to want to study the unit.

In addition to each preservice student making a unit box during the semester, they will teach two of their daily lessons from their unit box to their peers. These microteaching sessions are done in groups of four to six classmates. The first microteaching session is to be their first lesson. Many students have utilized a trade book and/or discrepant event in their first lesson. This is a very effective teaching strategy because it motivates preoperational and concrete operational children to want to study the unit. This microteaching session allows students to try their teaching techniques with a small group. Each of the teaching sessions are audio-recorded. The peers being taught evaluate the preservice teacher at the conclusion of his/her teaching session (Appendix A). After the session, the preservice student listens to his/her teaching tape and completes an evaluation form on their teaching (Appendix B). The preservice students are to incorporate their peer's evaluations into their microteaching self-critique. During the second session the same format is utilized but they may chose any lesson they want to teach from their unit box. During the second microteaching, the preservice students are to concentrate on questioning strategies (operational questions, wait-time I and II, etc).

Since many preservice students commented that it was difficult to pretend that college students were second graders during the two microteaching experiences, the preservice students were asked to teach a minimum of two lessons from their unit box in an elementary school. This provided the preservice students with actual experiences with elementary children. These classroom teaching experiences were to be with small groups and with

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at least one of the lessons to include their learning center. After each teaching experience, the preservice student was asked to submit a detailed log describing their experiences. Their responses are patterned after side two of the microteaching self-critique (Appendix B).

The microteaching with their peers and the public school teaching experiences allow the preservice students to evaluate their unit box prior to submitting it for grading. These experiences also allow the preservice student to determine whether lesson components are facilitative or non-facilitative. Throughout the two months of the unit box assignment, the preservice students have components of the unit box that are submitted for review. This presubmission technique forces the preservice students to be thinking about the unit box throughout the semester rather than just prior to when it is to be submitted. In addition, the instructor's comments can be appraised and incorporated into the unit box by the preservice student. By the time the unit box is to be submitted, the preservice students have a well developed unit box. The unit boxes are then evaluated according to the evaluation form in Appendix C.

In summary, unit boxes help preservice students develop teachable science units boxes based on commercially available teachers guides. Upon completion of the unit box, the preservice students have a teaching unit ready for student teaching and/or first year teaching.

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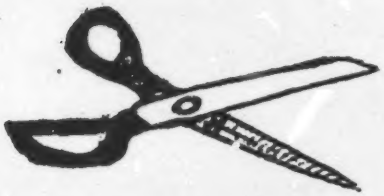
RUBBER BAND



A □ IN A

– LOOK LIKE

Go to Card 2

Card 2

PUT AROUND

THE . NOW

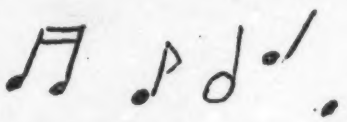


Figure 1 Rebus TAsk cards for sound unit

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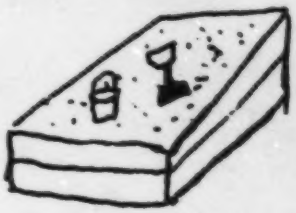
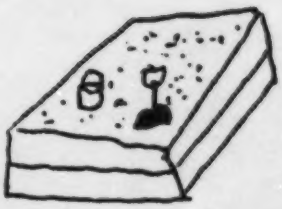
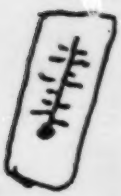
Take a and put some  in it. Put the and  in the . Put a  in the .   what happens?

Figure 2 Solar energy rebus task card

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Card 3

How many do you take to get across the room?

your answer on your .

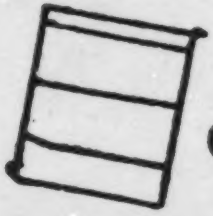
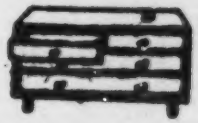
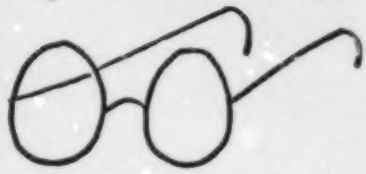
Put your  on Miss Holt's  .

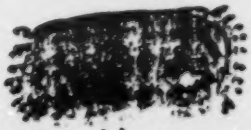
Figure 3 Rebus task card illustrating classroom management techniques



at the

the

How do they feel?

Would you like to use one for a 

?

Figure 4 Rock Unit Rebus task card upper level students

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APPENDIX A

Evaluation Sheet: Microteaching

Teacher _____ Topic _____

Observer _____ Date _____ Grade Level ____

Using the following scale respond to the statements in relationship to the microteaching experience you are viewing.

1 very weak
2 below average
3 average
4 strong
5 superior
6 outstanding
7 truly exceptional

1. The purpose of the lesson was clear.	1	2	3	4	5	6	7
2. The aims of the lesson were appropriate for the level of the students	1	2	3	4	5	6	7
3. The lesson was well organized.	1	2	3	4	5	6	7
4. The content of the lesson was appropriate to the aims of the lesson.	1	2	3	4	5	6	7
5. The method selected was appropriate to the content of the lesson.	1	2	3	4	5	6	7
6. The lesson was clear and understandable to the students.	1	2	3	4	5	6	7
7. The class was attentive and actively participated in the lesson.	1	2	3	4	5	6	7
8. The tempo of the lesson was governed by student understanding.	1	2	3	4	5	6	7
9. General overall rating of microteach.	1	2	3	4	5	6	7

COMMENTS:

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APPENDIX B

MICRO-TEACHING CRITIQUE

Name: _____ Topic _____

Date Submitted: _____ Grade Level _____

In order to evaluate the microteaching situation, please respond to the following comments by encircling the number on the line that represents your reaction.

1. My reaction to the value of this experience is:

1	2	3	4	5	6	7
Most unfavorable			Moderate			Most favorable

2. The amount of my personal learning from this session is:

1	2	3	4	5	6	7
Very limited			Moderate			A great deal

3. In terms of learning about teaching I learned:

1	2	3	4	5	6	7
Very little			Some			A great deal

4. I felt this session was a pleasant one:

1	2	3	4	5	6	7
Very definitely not			Somewhat			Very definitely so

5. If I could repeat this experience, I would:

1	2	3	4	5	6	7
Do the same			Change a little			Change a great deal

6. I thought the student's response overall was:

1	2	3	4	5	6	7
Poor			Moderate			Exceptionally good

7. I found the post-microteach evaluation comments made by the other students to be:

1	2	3	4	5	6	7
Very negative			Just right			Too positive

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Comment briefly on the following:

8. What difficulties did you encounter in attempting to teach?

9. What significant aspects of the lesson would you change if you could?

10. What were the high spots of the experience?

11. What were the low spots of this experience?

12. Additional comments about your questioning techniques:

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Science Unit Box Title _____

Prepared by _____ Target Grade _____

S = Satisfactory I = Incomplete U = Unsatisfactory D = Duplicate Missing
NA = Not Applicable

CATEGORIES	RATING	COMMENTS
1. Teachers Guide(s)		
2. Manipulative Materials		
3. Behavioral Objectives		
Cognitive		
Affective		
Psychomotor		
4. Parental letter		
5. Record sheets		
6. Tape, etc. (optional)		
7. Overhead Transparencies (optional)		
8. Trade Books with Readability		
9. Background Information		
10. Resource Speakers, field trips, etc. (optional)		
11. Vocabulary (optional)		
12. Evaluation Procedures		
Formative		
Summative		
13. Bulletin Board Plans		
14. Poor Reader Task Cards		
15. Instructional Materials		
16. Organization of box		

Score on Unit Box _____

OVERALL COMMENTS:

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